



# Inductive Proximity Sensors

## PAM Series

**PAM-AP-1A****PAM-AP-2H**

### Tubular M12 (12mm) – DC

#### Features

- Nickel-plated brass construction
- Axial cable or M12 quick-disconnect models
- Complete overload protection
- IP67 rated
- LED status indicator
- Mounting hardware included
- Lifetime warranty

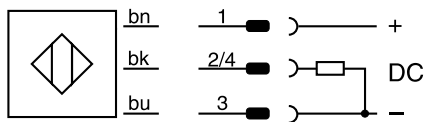


### Tubular M12 DC Inductive Proximity Sensors PAM Series Selection Chart

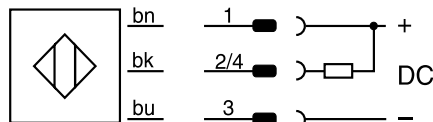
Part Number	Price	Sensing Distance mm [in]	Mounting	Output State	Logic	Connection	Weight g [oz]	Body Size mm [in]	Drawing Link
<a href="#"><u>PAM-AP-1A</u></a>	\$10.50	2 [0.07]	Flush	N.O.	PNP	PVC, 3-wire pigtail 2m [6.5 ft], 22AWG	90.5 [3.19]	35 [1.37]	<a href="#"><u>PDF</u></a>
<a href="#"><u>PAM-AP-1H</u></a>	\$10.50					4-pin M12 quick-disconnect [purchase cable separately]	23.5 [0.82]	45 [0.77]	<a href="#"><u>PDF</u></a>
<a href="#"><u>PAM-AN-1H</u></a>	\$10.50				NPN				<a href="#"><u>PDF</u></a>
<a href="#"><u>PAM-AP-2A</u></a>	\$10.50	4 [0.15]	Non-flush	N.O.	PNP	PVC, 3-wire pigtail 2m [6.5 ft], 22AWG	91.4 [3.22]	35 [1.37]	<a href="#"><u>PDF</u></a>
<a href="#"><u>PAM-AP-2H</u></a>	\$10.50					4-pin M12 quick-disconnect [purchase cable separately]	23.4 [0.82]	45 [0.77]	<a href="#"><u>PDF</u></a>
<a href="#"><u>PAM-AN-2H</u></a>	\$10.50				NPN				<a href="#"><u>PDF</u></a>

## Wiring Diagrams

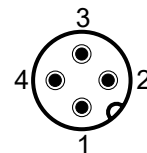
#### PNP Cable



#### NPN Cable



#### M12 Connector





# Inductive Proximity Sensors

## PAM Series Specifications

Tubular M12 DC Inductive Proximity Sensors PAM Series Specifications		
<b>Mounting Type</b>	Flush	Non-Flush
<b>Rated Operating Distance</b>	2mm [0.07 in]	4mm [0.15 in]
<b>Assured Operating Distance</b>	$\leq (0.81 \times S_n)$ mm	
<b>Repeat Accuracy</b>	0.1 mm	0.2 mm
<b>Hysteresis</b>	$\leq 20\% S_r$	
<b>Temperature Drift</b>	$\leq 10\% S_r$	
<b>Material Correction Factors</b>	See the <a href="#">Material Influence Table</a>	
<b>Output Type</b>	PNP or NPN, N.O.	
<b>Operating Voltage</b>	10 to 30 VDC	
<b>Residual Ripple</b>	$\leq 20\% U_B$	
<b>Output Current</b>	$\leq 200\text{mA}$	
<b>Output Voltage Drop</b>	$\leq 2.0\text{ V @ }200\text{mA}$	
<b>Power Consumption (no-load)</b>	$\leq 10\text{ mA}$	
<b>Residual Current</b>	$\leq 0.1\text{ mA}$	
<b>Switching Frequency</b>	3kHz	2kHz
<b>Short-Circuit Protection</b>	Yes	
<b>Reverse Polarity Protection</b>	Yes	
<b>Operating Temperature</b>	$-25\text{ to }70^\circ\text{C}$ [ $-13\text{ to }158^\circ\text{F}$ ]	
<b>Protection Degree (DIN 40050)</b>	IP67	
<b>Indication/Switch Status</b>	LED, Yellow Sensing state ( $0 \leq s \leq S_r$ )	
<b>Mounting</b>	Embeddable	Non-embeddable
<b>Housing Material</b>	Nickel-plated brass	
<b>Sensing Face Material</b>	PBTP (polybutylene terephthalate)	
<b>Shock/Vibration</b>	IEC 60947-5-2	
<b>Agency Approvals</b>	cULus File E328811, CE	

To obtain the most current agency approval information, see the Agency Compliance & Certifications section on the specific part number's web page.

# Accessories for 12mm Sensors

## Axial Mounting Bracket

Mounting bracket, axial, available in zinc-plated steel or 316L stainless steel. For use with 12mm sensors. Has two mounting holes (use 3mm screws) and allows the rotation of an optical axis for right-angle adapter sensors. Hexagonal nuts not included.

Accessories for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
<a href="#"><u>ST12A</u></a>	\$2.00	Micro Detectors mounting bracket, axial, zinc plated steel. For use with 12mm sensors.	<a href="#"><u>PDF</u></a>	0.03 [13.6]
<a href="#"><u>ST12A7W</u></a>	\$7.25	Micro Detectors mounting bracket, axial, 316L stainless steel. For use with 12mm sensors.	<a href="#"><u>PDF</u></a>	0.03 [13.6]



[ST12A](#)

## Right-angle Mounting Bracket

Mounting bracket, right-angle, zinc-plated steel or 316L stainless steel. For use with 12mm sensors. Has two mounting holes (use 3mm screws) and allows the rotation of an optical axis for axial sensors. Hexagonal screws not included.

Accessories for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
<a href="#"><u>ST12C</u></a>	\$2.00	Micro Detectors mounting bracket, right-angle, zinc plated steel. For use with 12mm sensors.	<a href="#"><u>PDF</u></a>	0.03 [13.6]
<a href="#"><u>ST12C7W</u></a>	\$7.25	Micro Detectors mounting bracket, right-angle, 316L stainless steel. For use with 12mm sensors.	<a href="#"><u>PDF</u></a>	0.03 [13.6]



[ST12C](#)

# Accessories for 12mm Sensors

## Right-angle Mounting Brackets

Mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 12mm sensors. Available with or without fixed insertion stop.

Accessories for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
<a href="#"><u>OPT2102</u></a>	\$8.00	Wenglor mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 12mm sensors.	<a href="#"><u>PDF</u></a>	0.05 [22.7]
<a href="#"><u>OPT2103</u></a>	\$8.00	Wenglor mounting bracket, right-angle, plastic. For use with 12mm sensors.	<a href="#"><u>PDF</u></a>	0.05 [22.7]



[OPT2102](#), [OPT2103](#)

## Right-angle Swivel Mounting Systems

Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with 12mm sensors. Available in all stainless steel or with an aluminum head and stainless steel mounting plate.

Accessories for 12mm Sensors						
Part Number	Price	Description	Mounting Head	Mounting Plate	Drawing Link	Weight lb [g]
<a href="#"><u>OPT2114</u></a>	\$11.50	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with 12mm sensors.	Aluminum	Stainless steel	<a href="#"><u>PDF</u></a>	0.14 [63.5]
<a href="#"><u>OPT2115</u></a>	\$21.00	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with 12mm sensors.	304 Stainless steel	304 Stainless steel	<a href="#"><u>PDF</u></a>	0.27 [122.5]

Note: 304 stainless steel mounting rods sold separately: [OPT2109](#) (200mm [7.87 in] length), [OPT2110](#) (300mm [11.81 in] length), and [OPT2111](#) (500mm [19.69 in] length).



[OPT2114](#), [OPT2115](#)